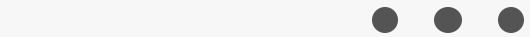
Glucometer Helper

Group C32



Prepared by Bowen, Jerry, Lucas, Collin, Abdullah, Christopher

Customer Needs

Benchmarking

Devices	Weight	Device #1	Device #2	Device #3
Name	N/A	Freestyle Libre (Flash Glucometer)	Contour NEXT EZ (standard)	Prodigy Voice Glucometer (spoken results)
Link	N/A	Click me	Click me	Click me
Image	N/A	Figure 1	Figure 2	Figure 3
Accuracy	5	92.8%	Roughly 99%	Roughly 99%
Memory	3	32 readings	30 days of readings	450 readings, up to 90 days
Result time	4	Does test every 30 minutes and returns results to an NFC device as soon as it is taped to the sensor	Within 5 seconds	Within 7 seconds
Cost (CAD)	3	Reader:89.85; Fourteen day sensor: 89.85	Kit with 100 tests:68.50; 100 tests:50	Reader 57.31 (uses standard paper)
Weight	3	Reader: 65g; Sensor: 5g	Total kit: 50 grams	50 grams, battery: 61.5
Size	3	95 x 60 x 16 mm	160 x 117 x 84 mm	110 x 65 x 20 mm
Accessibility	5	The omission of a lancelet is helpful but the process of applying the sensor may be difficult.	Standard glucometer.	Very the use of physical buttons with tactile feedback and auditory response makes this very usable for the visually imapred.
Durability	4	Good	Okay	Good
Total	90	71	70	83

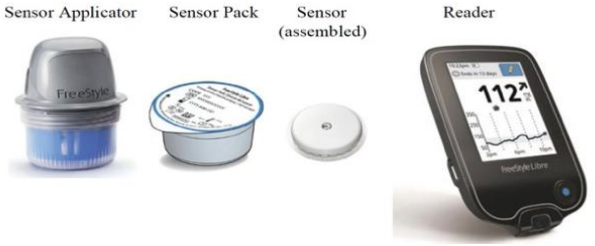


Figure 1: Freestyle Libre

Figure 2: Contour NEXT EZ

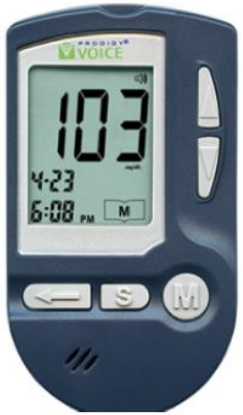


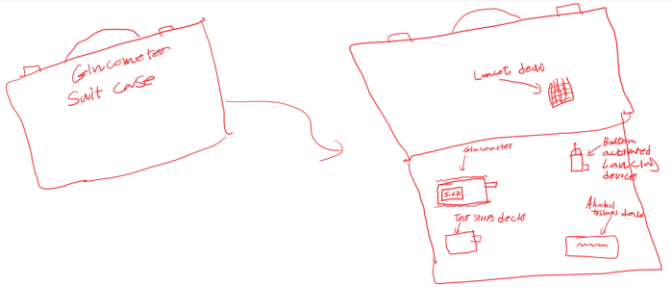
Figure 3: Prodigy Voice Glucometer

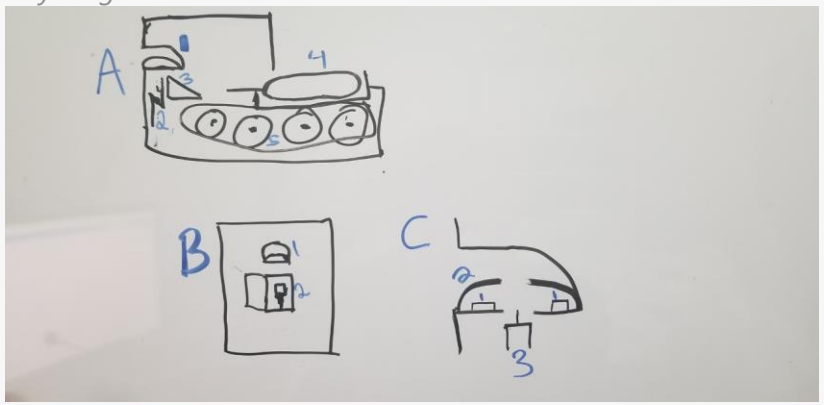
Target Specifications

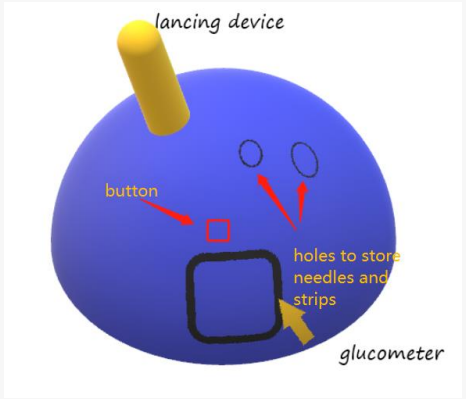
Design Criteria	Acceptable Specifications	Ideal Specifications
Accuracy	92%-95%	95%+
Result Time	Under a minute	Less than 10 seconds
Accessibility of use (number of steps)	5-10 steps	10 steps
Cost (CAD)	100$ - 140$	Under 100$
Weight	Less than 150 grams	Less than 75 grams
Memory	Stores at least a day worth of data	Stores a week worth of data or more

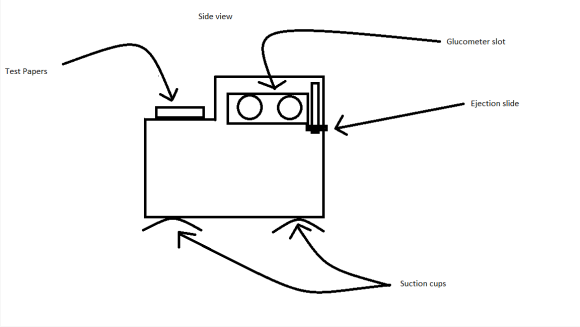
Concepts

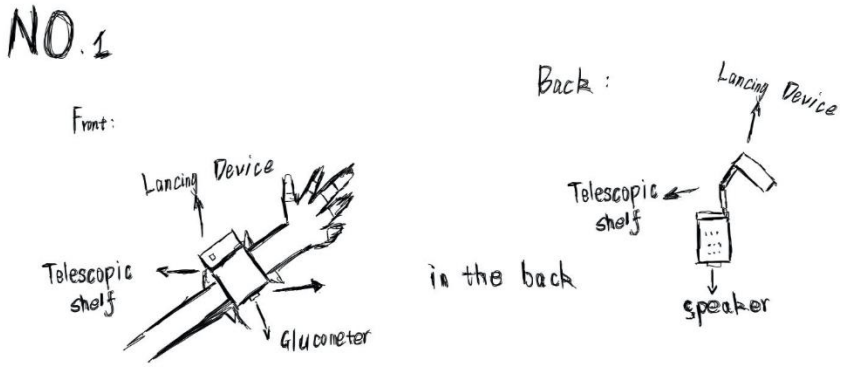
Conceptual designs at the early stage

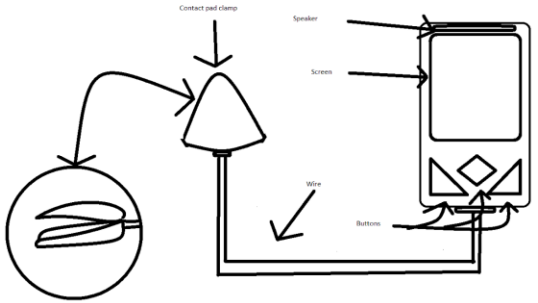


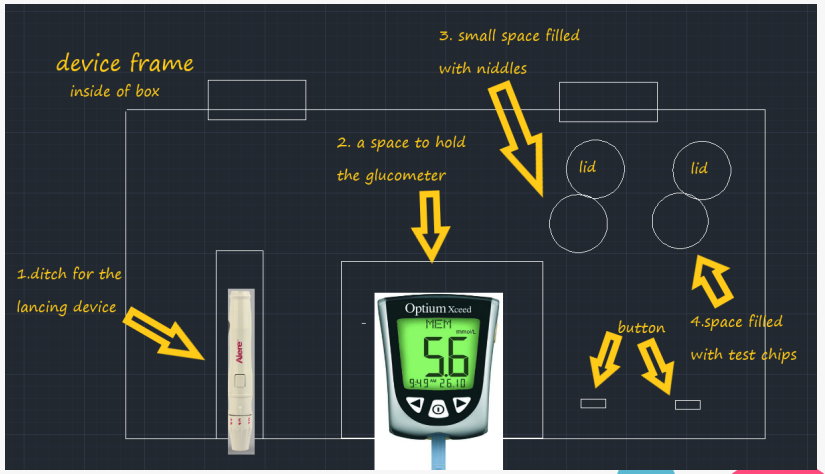








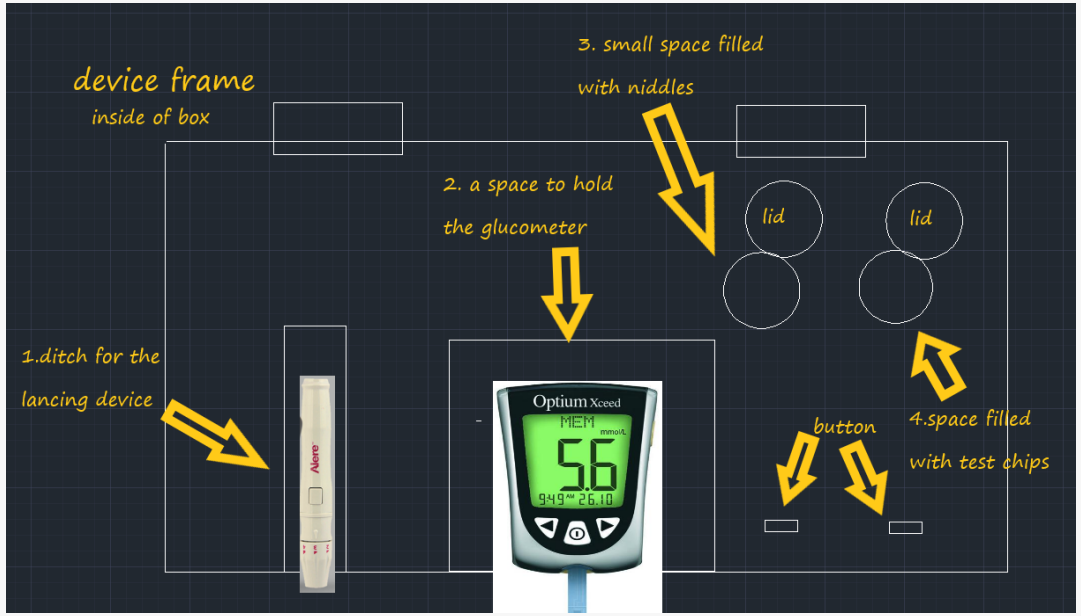




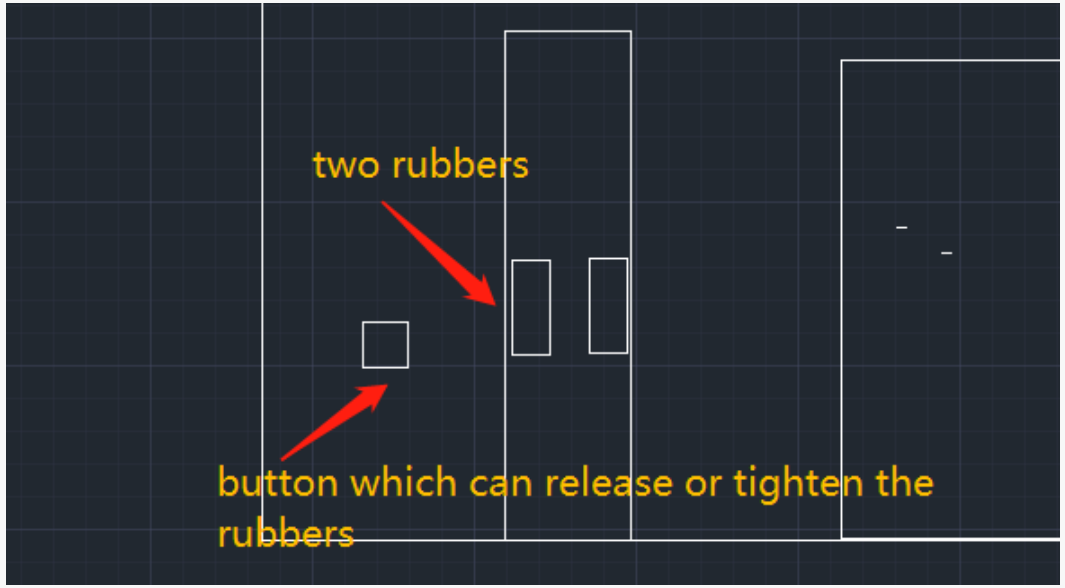
Concepts

Conceptual design 1

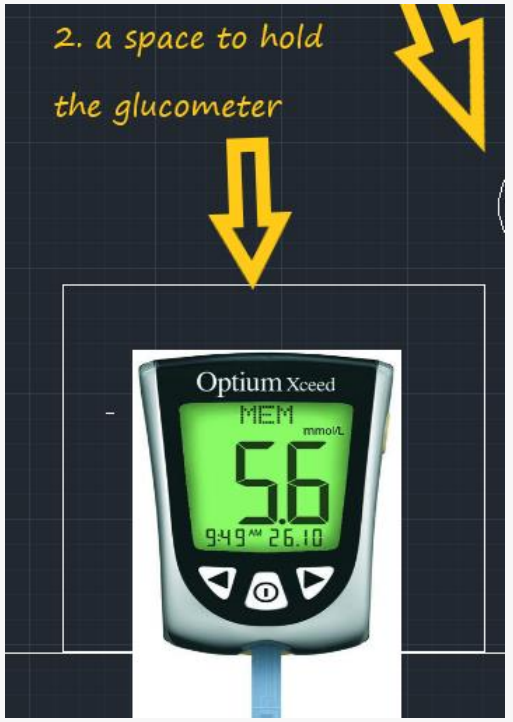
overview



lancing device part



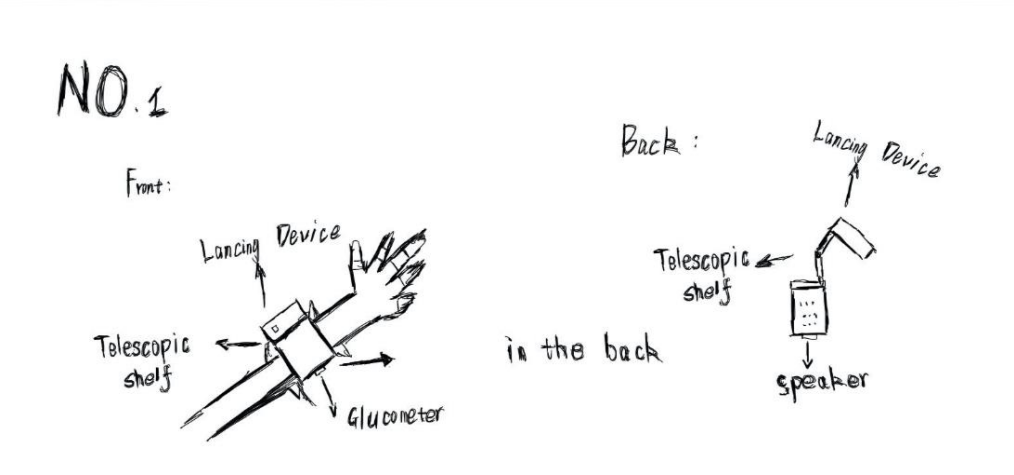
Glucometer part



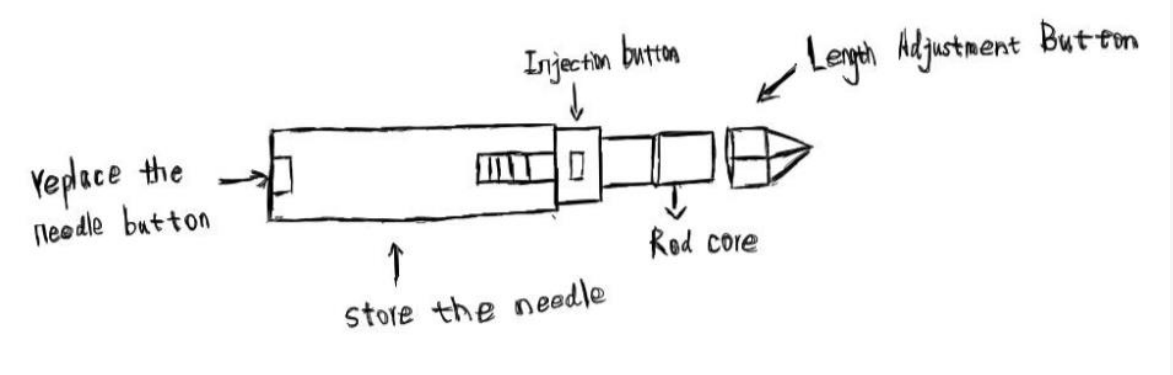
Concepts

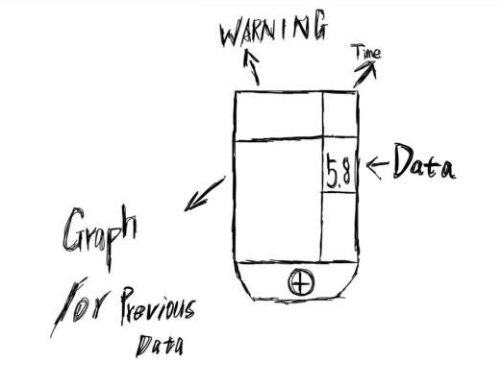
Conceptual design 2

overview



lancing device part



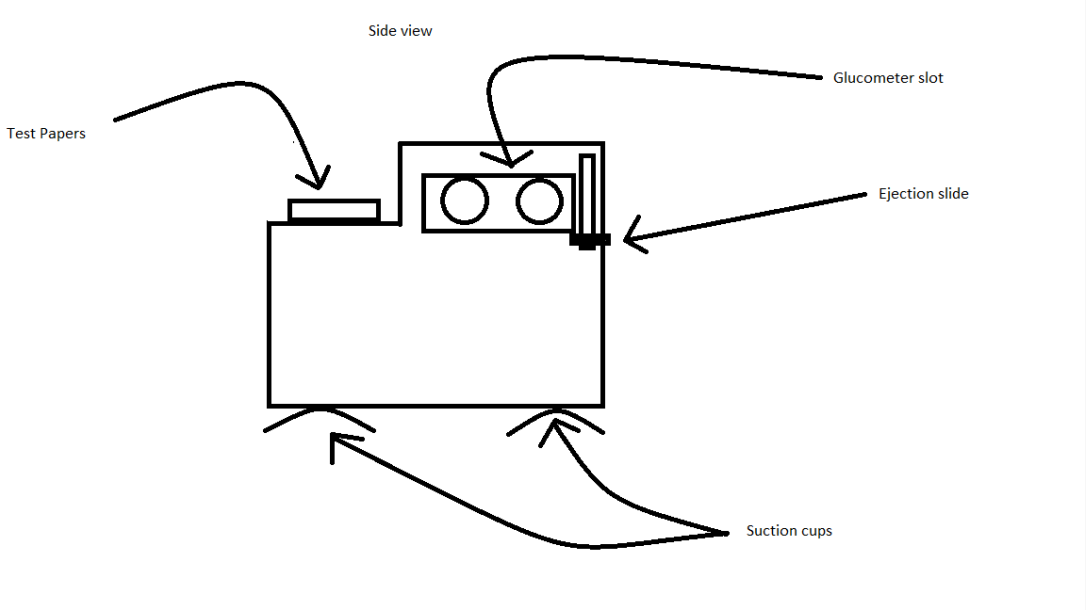


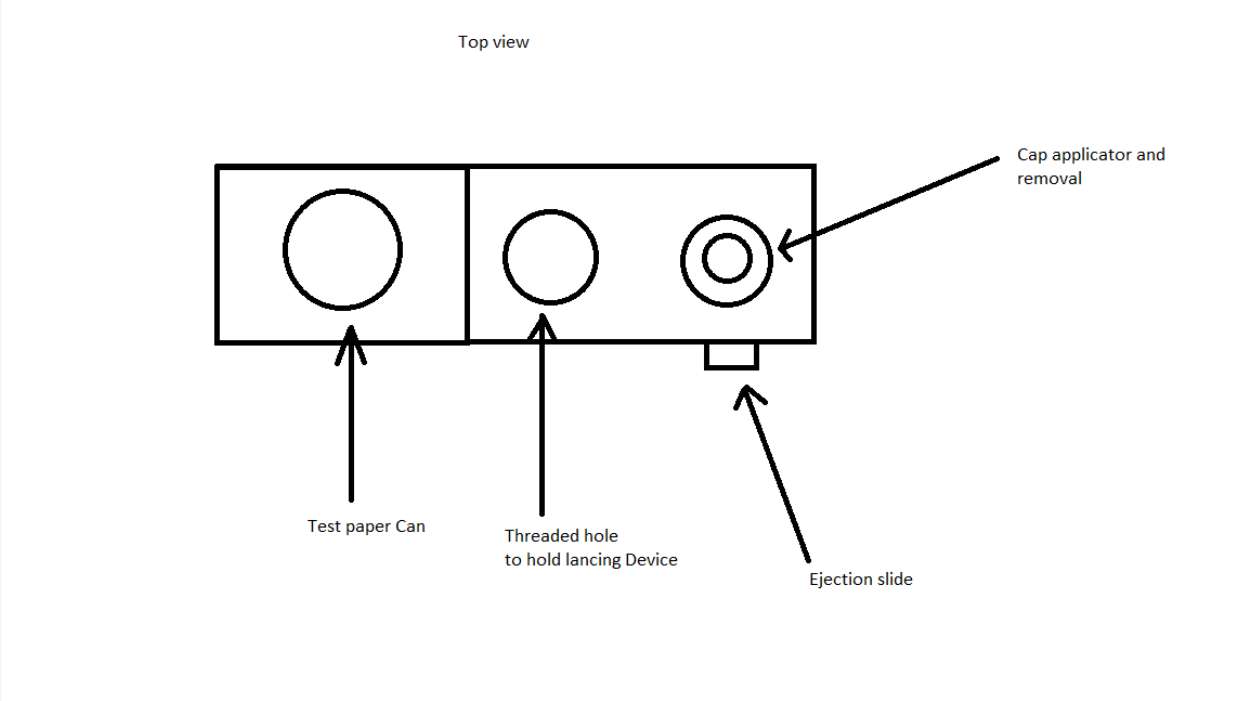
Glucometer part

Concepts

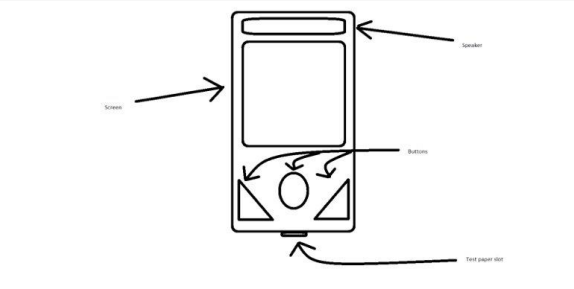
Conceptual design 3

overview





Glucometer part



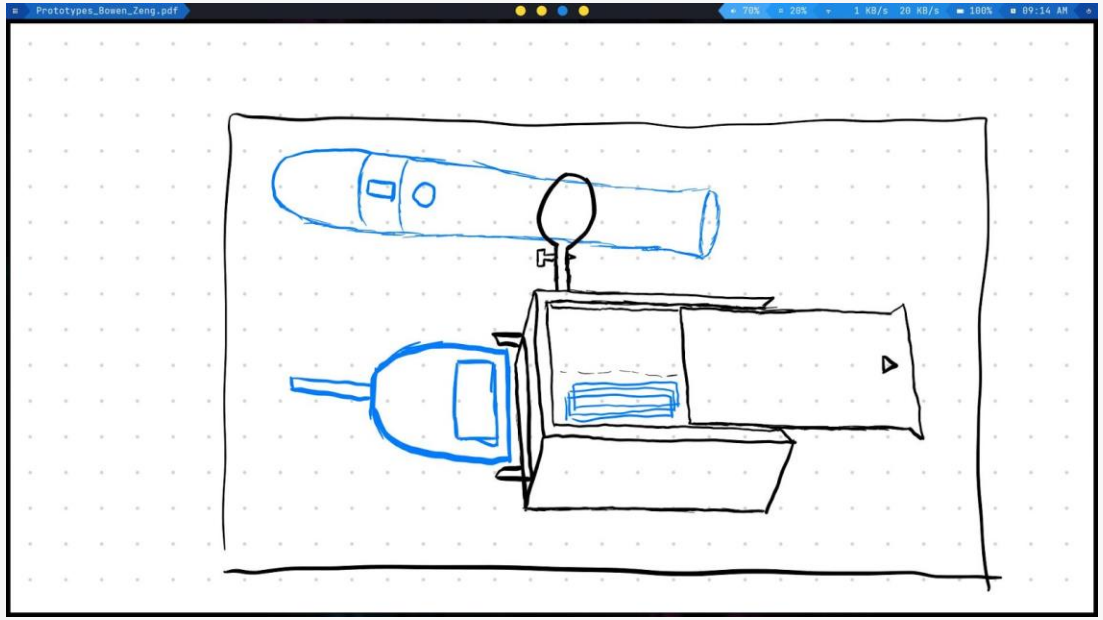
Decision Matrix

Devices	Weight	Glucometer helper	Cased Arduino Glucometer	Clamshell Glycemic Meter
Name	N/A	Bowen	Abdullah	Jerry
Accuracy	5	Depends on base glucometer	Untested	Untested
Memory	3	Depends on base glucomete	32kb	Unknown
Result time	4	Depends on base glucomete	Within 5 seconds	Unknown
Cost (CAD)	3	Made from cheap and available materials ($30)	Custom shield PCB, Arduino Uno and Casing material ($100)	less than $100
Weight	3	light weight, under 100g	100g 150g	under 100g
Size	3	50 x 100 x 100 mm	50 x 100 x 100 mm	20 x 40 x 5 mm
Accessibility	5	Clamps will hold components in place for ease of use with one hand	Box will hold components in place for ease of use with one hand	Base can sit on a table such that user can operate the device with one hand
Durability	4	Good	Okay	Good
Total	90	87	74	61

Feasibility study

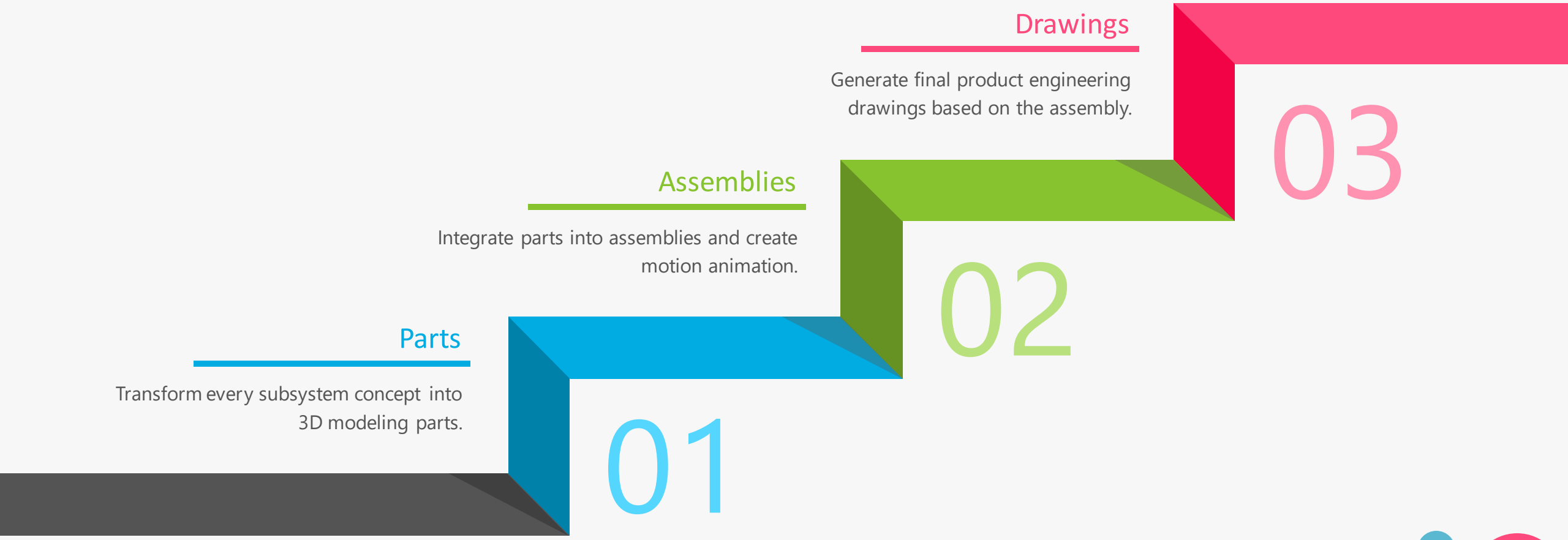
How feasible is our chosen design

- Materials are easy to require
- Whole system run by mechanism
- Allows different modifications



Prototype Dev Plan

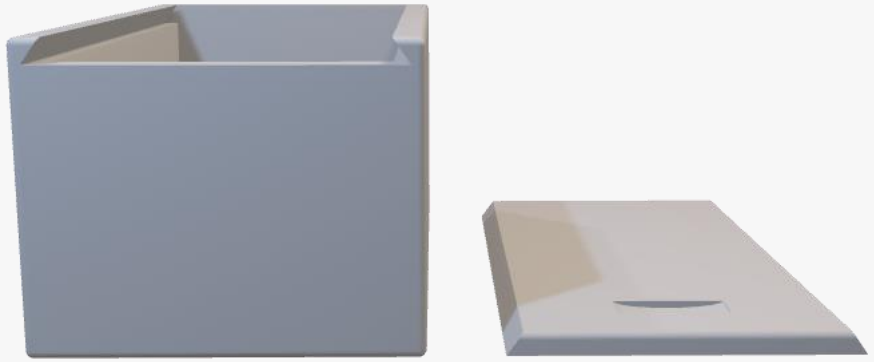
Development stages



Prototype Progress

Current stage: 3D Parts

Sliding lid box



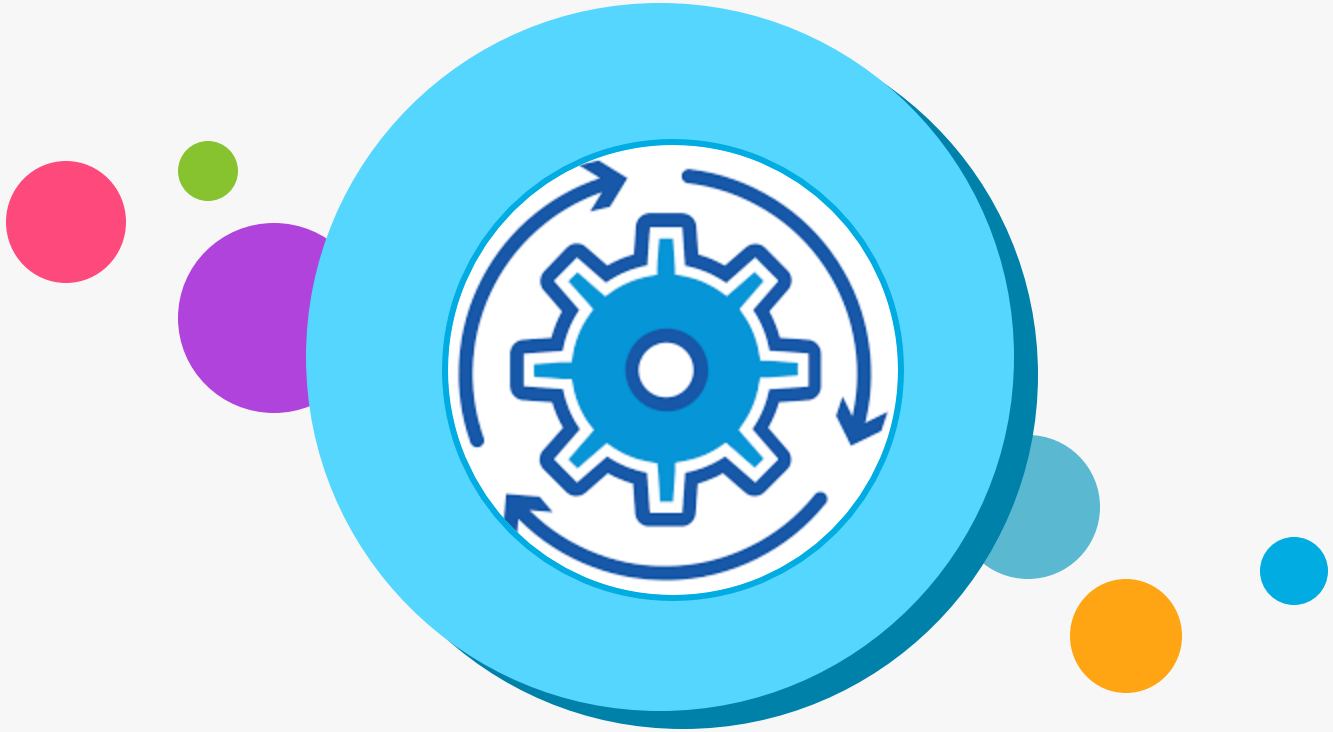
Lancing device holder

Prototypes Testing

A cardboard version of the product to verify the feasibility of our prototype.

Project Plan

1. Current leftover number of iterations left still to do.
2. Goals of each prototype.
3. What will make Prototype 2 different from 1? How will it be tested?
4. Prototype 3's reason and goal.
5. How we will use Prototype 1, 2 and 3's results to finalize our design.

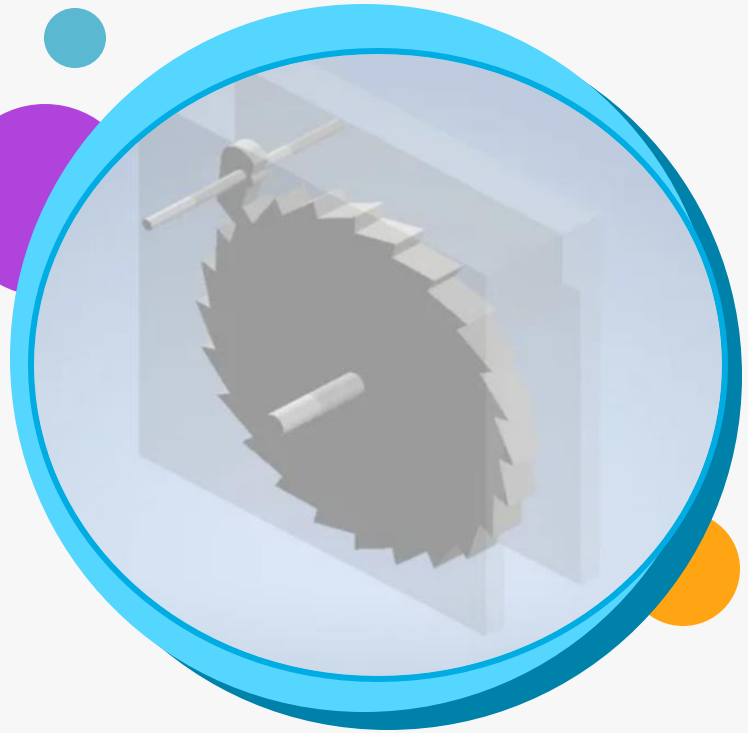


Improvements

The next steps

Improvement 1: Lancing device Rig

Lancing Device Manipulation



Improvements

- Why are we focused on this part of the design?
- How are we combatting the issue?
- How is it working?
- How can it be improved?

Improvement 2: Storage

Storage of Glucometer & Glucometer accessories

Separated Compartment Storage

- Currently what is being done regarding this aspect of the design?
- How we intend to improve it?
- Why do we need to improve it?

Stability

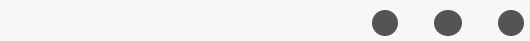
How well does our design stay in place?

Adding more stability.

- Why it's important?
- Why is it a difficult obstacle to solve?
- How we intent to combat the issue?

Glucometer Helper

Thank you for watching



Bibliography

Stackable Multi Box / Slide Lid with Text and Compartments by Magonegro. 27 Dec. 2016, www.thingiverse.com/thing:1999256.

Thingiverse.com. "Stackable Multi Box / Slide Lid with Text and Compartments by Magonegro." *Thingiverse*, 27 Dec. 2016, www.thingiverse.com/thing:1999256.

Thingiverse.com. "Ratchet and Pawl Mechanism by Timjang." *Thingiverse*, 23 June 2019, www.thingiverse.com/thing:3708498.

"Tableaux De Bord Et Rapports De Construction: Autodesk BIM 360." *BIM 360*, 25 Mar. 2020, www.autodesk.fr/bim-360/construction-management-software/construction-data-analytics-reporting/construction-reports-dashboards/.

"FreeStyle Libre |" by Abbott,

https://www.freestyle.abbott/ca/en/products/libre.html.

"Contour NEXT EZ (standard)" by Amazon,

https://www.amazon.com/Contour-Diabetes-Testing-Lancets-Solution/dp/B00NG0MSPQ/?tag=dotdashvhealt-20&ascsubtag=4686590%7Cn6530a54844f746b08fd43943b8a0ad5121.

"Prodigy Voice Glucometer" by Prodigy Diabetes Care,

https://www.prodigymeter.com/consumers/diabetic-supplies/prodigy-voice-talking-glucose-meter/.